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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,296	09/17/2003	David J. Power	061459 303139	8403

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EXAMINER	
COY, NICOLE A	
ART UNIT	**PAPER NUMBER**
3672	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,296	POWER ET AL.	
	Examiner	Art Unit	
	Nicole Coy	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17 and 27-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17 and 27-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 10/3/2005, with respect to the rejection(s) of claim(s) 1, 4-8,17-19, and 21-29 under Bowden have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Prior et al. (2004/0226748). Accordingly, the rejection is non-final.

Applicant first admits that element 55 is the actual motor which drives the winch. Prior describes this motor as an electrical, diesel or other appropriate motor. See page 2 paragraph 0022. As motor 55 is the electrical motor which drives the winch, Prior et al. discloses "an electric servo motor operatively coupled to a winch brake control" as claimed by Applicant. Thus, Prior et al. does disclose using an electric servo motor as recited in the Applicant's claims.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the Prior et al. reference teaches pulling the drill string, which is opposite of the intended use of the Applicant's invention, wherein the drill string is released into the wellbore by Earth's gravity) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In addition, the applicant argues that the Prior et al. reference does not disclose or suggest an electric servo motor operatively coupled to the winch brake controller as the solution to the problem of band brakes. However, the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. In the instant case, the claimed invention is structurally similar to the automatic drilling system of Prior et al. Therefore, it does not matter where the Prior et al. reference discloses an electric servo motor operatively coupled to the winch brake controller as the solution to the problem of band brakes.

The applicant further argues that Prior et al. does not disclose "measuring a parameter related to position of a drawworks brake." However, Prior et al. does disclose measuring a parameter related to the position of the drawworks brake. See page 3 paragraph 0028, wherein Prior et al. discloses that the control system is in signal connection with the brake assembly to provide brake control signals and continuously receive output control signals from the load sensing deice, the encoder, and the torque sensor. The position of the brake is inherently measure and adjusted in order to maintain the appropriate values for the specified drill parameters.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3-14, 17, and 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Prior et al. (Patent Application Publication 2004/0226748). Note figure 1.

With regard to claim 1, Prior et al. discloses an automatic drilling system (50) comprising an electric servo motor (55) operatively coupled to a winch brake control (80), a servo controller (110) operatively coupled to the servo motor (55); a drum position encoder (100) rotationally coupled to a winch drum (26) and operatively coupled to the servo controller (110), the servo controller (110) adapted to operate the servo motor (55) in response to measurements of position made by the encoder (100) so that a selected rate of rotation of the winch drum (65) is maintained.

With regard to claim 3, the reference discloses a winch brake operated by a winch brake control comprising a band brake. (Page 2, paragraph 0024).

With regard to claim 4, the reference discloses a selected rate of rotation related to a selected rate of axial motion of a drill string. (Page 3, paragraph 0026).

With regard to claim 5, the reference discloses a drilling fluid pressure sensor operatively coupled to the servo controller, the servo controller adapted to control the rate of rotation so as to substantially maintain a predetermined drilling fluid pressure. See page 4 paragraph 0041.

With regard to claim 6, the reference discloses a bit weight sensor operatively coupled to the servo controller, the controller adapted to control the rate of rotation so

as to substantially maintain a predetermined axial force on a drill bit. See page 4 paragraph 41.

With regard to claim 7, the reference discloses a logic switch (102) selectable to conduct one or more of a plurality of control signals to the servo controller, the control signals setting the selected rate of rotation. (Page 3, paragraph 0026).

With respect to claim 8, Prior et al. discloses that the control signal comprises at least one of drilling fluid pressure, axial force on a drill bit, rate of penetration of a drill bit, wellbore inclination and wellbore azimuth. See page 3 paragraph 0026 and page 4 paragraph 0041.

With respect to claim 9, Prior et al. discloses a rate optimizer operatively coupled at an input thereof to at least one drilling operating parameter sensor, an output of the optimizer operatively coupled to the servo controller, the optimizer adapted to calculate a rate of axial motion of the drill string in response to measurements of the at least one drilling operating parameter. See page 4 paragraph 0041.

With respect to claim 10, Prior et al. discloses that at least one drilling operating parameter sensor comprises a weigh on bit sensor. See page 4 paragraph 0041.

With respect to claim 11, Prior et al. discloses that at least one drilling operating parameter sensor comprises a drill string torque sensor. See page 3 paragraph 0027.

With respect to claim 12, Prior et al. discloses that at least one drilling operating parameter sensor comprises a drill string rotation rate sensor. See page 4 paragraph 0041 and page 3 paragraph 0026.

With respect to claim 13, Prior et al. discloses that at least one drilling operating parameter sensor comprises a sensor measure a parameter related to axial position of the drill string. See page 3 paragraph 0026, wherein measuring the rate of hoisting would also determine the axial position of the drill string.

With respect to claim 14, Prior et al. discloses that the axial position sensor comprises the drum potion encoder. See page 3 paragraph 0026.

With regard to claim 17, the reference discloses a method for controlling a rate of release of a drill string, comprising: measuring a parameter related to rotational position of a drawworks drum; measuring a parameter related to operating position of a drawworks brake; determining a rate of rotation of the drum from the rotational position related parameter measurement; and adjusting the operating position of the brake so as to substantially maintain the rate of rotation at a selected value. (Figure 2; page 1 paragraph 0011; page 3 paragraphs 0026, 0028, 0031).

With regard to claim 27, the reference discloses a system comprising: a servo motor (55) coupled to a drawworks winch drum brake actuator; means (100) for determining drawworks winch drum speed of rotation; and, means for controlling said servo motor based upon a difference between said drawworks winch drum speed of rotation and a speed of rotation set point. (Page 2, paragraph 0032).

With regard to claim 28, the reference discloses a means for determining the drum speed of rotation which includes a rotary encoder (100) coupled to the drawworks winch drum (65); and means coupled to the rotary encoder for calculating the drawworks winch drum speed of rotation. (Page 2, paragraphs 0028-0031).

With regard to claim 29, the reference discloses a means for controlling a servo motor that includes a comparator for comparing the drawworks winch drum speed of rotation with the speed of rotation set point. (Page 2, paragraphs 0028-0031).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prior et al. (2004/0226748) in view of Mattero (USP 5,458,207).

Prior et al. does not teach the system comprising an encoder comprising a sine/cosine output transducer, as recited in claim 2. Mattero teaches that the measured parameters are correlated into a sine/cosine output in order to reduce inferior drilling results. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the automatic drilling system of Prior et al. in include the sine/cosine measurement output in order to reduce inferior drilling results.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prior et al. (2004/0226748) in view of Edwards et al. (U.S. 6,405,808).

Prior et al. discloses the invention substantially as claimed. Edwards et al. teaches a system wherein the inclination and/or azimuth of the wellbore path at multiple wellbore survey stations is acquired with a MWD tool wherein substantially continuous inclination measurements of the wellbore are acquired by a MWD tool during drilling, periodic survey points are established along the wellbore with the MWD tool or other measurement tool static within the wellbore and then integrating the survey point measurements with the substantially continuous inclination measurements to achieve a highly accurate measurement of the spatial position of the wellbore. The signal can be electronically filtered to minimize the influence of drilling noise and thereby enhance the vitality of the resulting measurements. The embodiment is the approximation of highly accurate survey data with lower quality survey data in such a manner that the accuracy of the overall borehole trajectory is improved.

Therefore it would have been obvious to one skilled in the art at the time of the invention to modify the controller of Prior et al. to include the wellbore trajectory survey system of Edwards et al. to increase the efficiency of the drilling process by providing a system which accurately measures properties of the formation, the wellbore trajectory or the drilling processes while at the same time minimizing any requirements to suspend the drilling process.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prior et al. (2004/0226748).

Prior et al. discloses an encoder with sufficient resolution to measure the rotational position of the drum. The Examiner notes that without any showing of criticality to provide an encoder with a resolution of about four million output increments per revolution of the drum, it would have been obvious to one skilled in the art at the time of the invention to provide an encode capable of relaying reasonable measurements of rotational position of the drum.

8. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prior et al. in view of Deng et al. (USP 6,246,343).

Prior et al. discloses an automatic drilling system comprising: a servo motor coupled to a drawworks winch drum brake actuator, means for determining drawworks winch drum speed of rotation; and, means for controlling said servo motor based upon a difference between said drawworks winch drum speed of rotation and a speed of rotation set point, as recited in claim 27.

Prior et al. does not teach the system recited in claims 30 and 31 wherein the means for controlling the servo motor includes a means for setting an angular position set point for a servo motor based upon a difference between the drawworks winch drum speed of rotation and the speed of rotation set point; and a means for determining the angular position of a servo motor; and means for comparing the angular position of the servo motor with the angular position set point, as recited in claims 30 and 31.

Deng et al. teaches an increment encoder error detection mechanism wherein the encoder senses rotational speed or position of a rotating portion of a machine. To

detect speed, the rotating angle is divided by the time elapsed for the angle. The number of pulses determines the rotating angle. The direction of rotation is detected from the two pulse signals by employing a flip-flop means with an output indicative of rotation in one direction or the other. Deng et al. suggests that a two channel method of measuring angular position is beneficial so that the controller for the rotating member, the drum, can take action to prevent undesirable results. Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify the automatic drilling system of Prior et al. to include the error detection mechanism of Deng et al. to monitor the angular position to detect encoder failure and to prevent related equipment failure.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole Coy whose telephone number is 571-272-5405. The examiner can normally be reached on M-F 8:00-5:30, 1st F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

nac

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